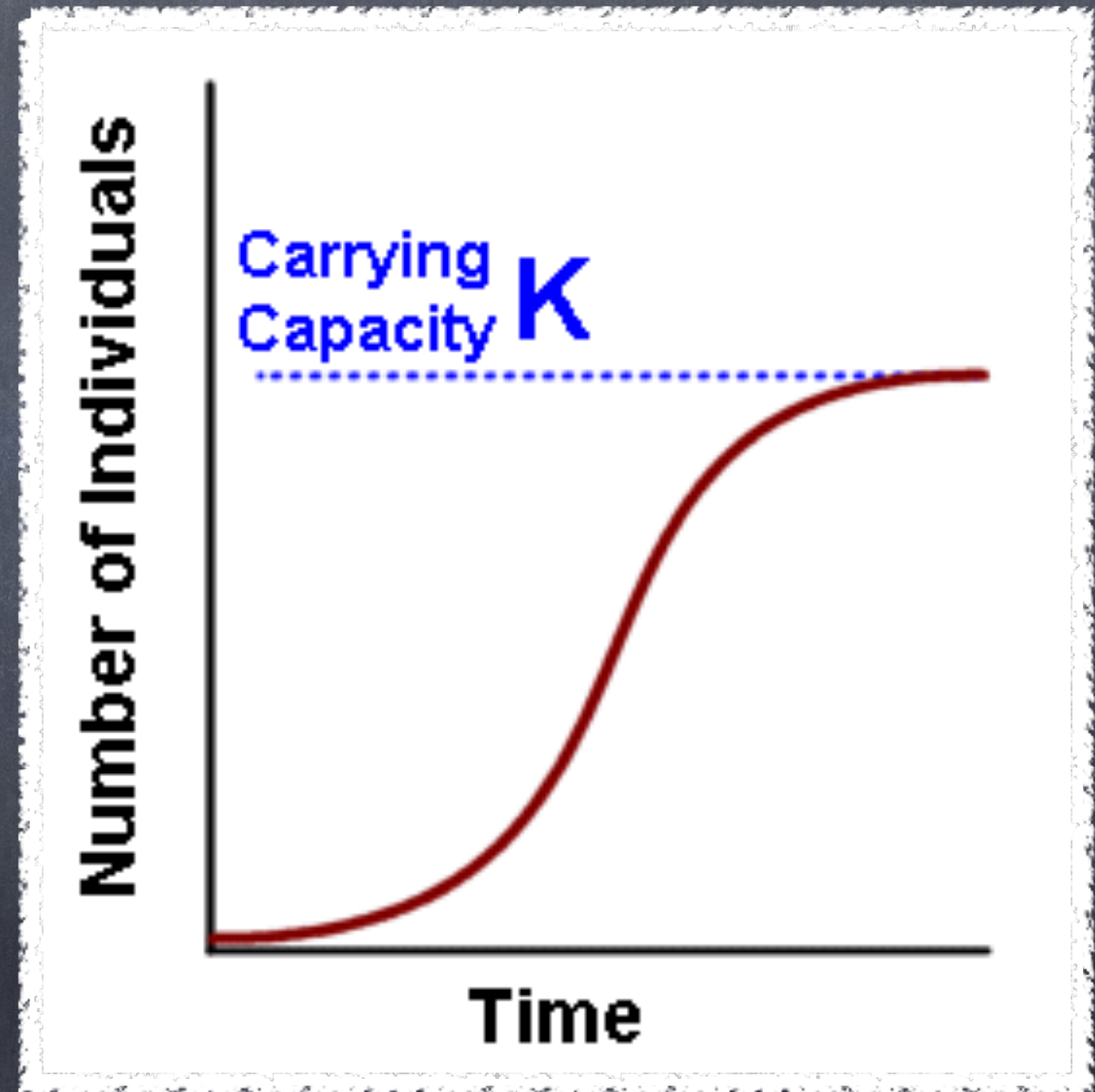


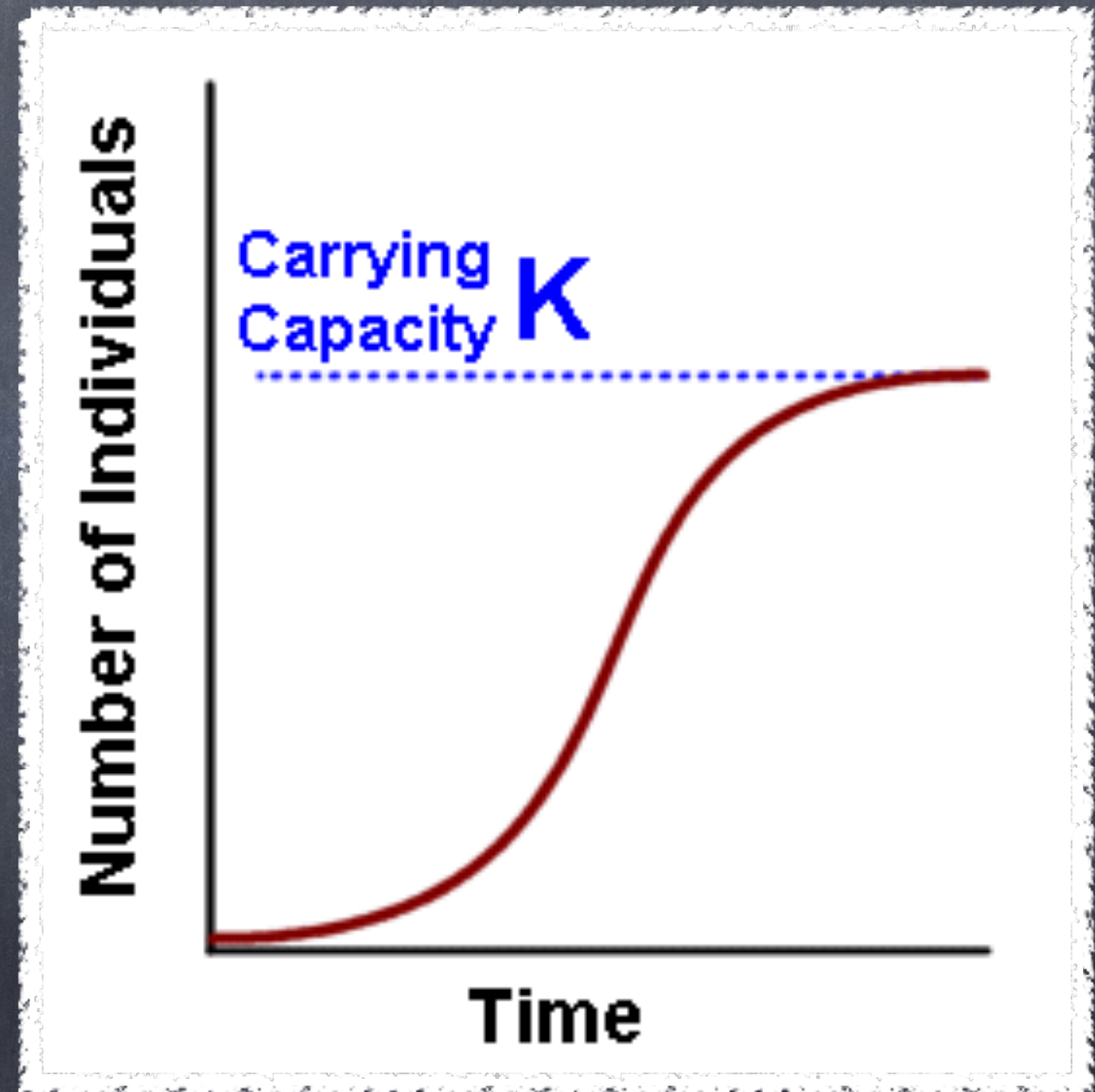
The Logistic Model

- Birth rates and death rates are not constant but vary with population size
 - Birth rates decline and death rates rise as the population grows.



The Logistic Model

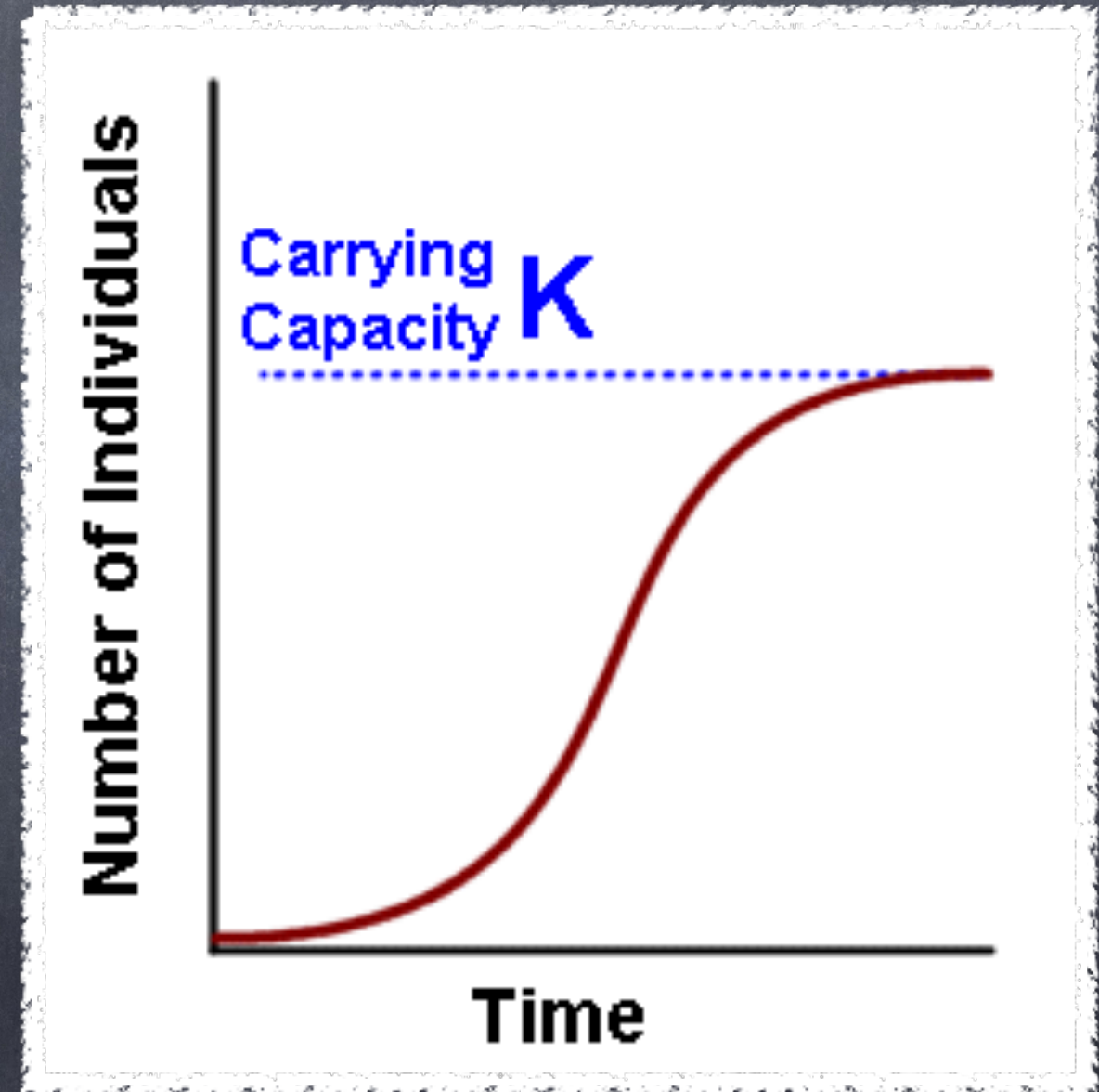
- The logistic model of population growth builds on the exponential model but accounts for the influence of limiting factors.



The Logistic Model

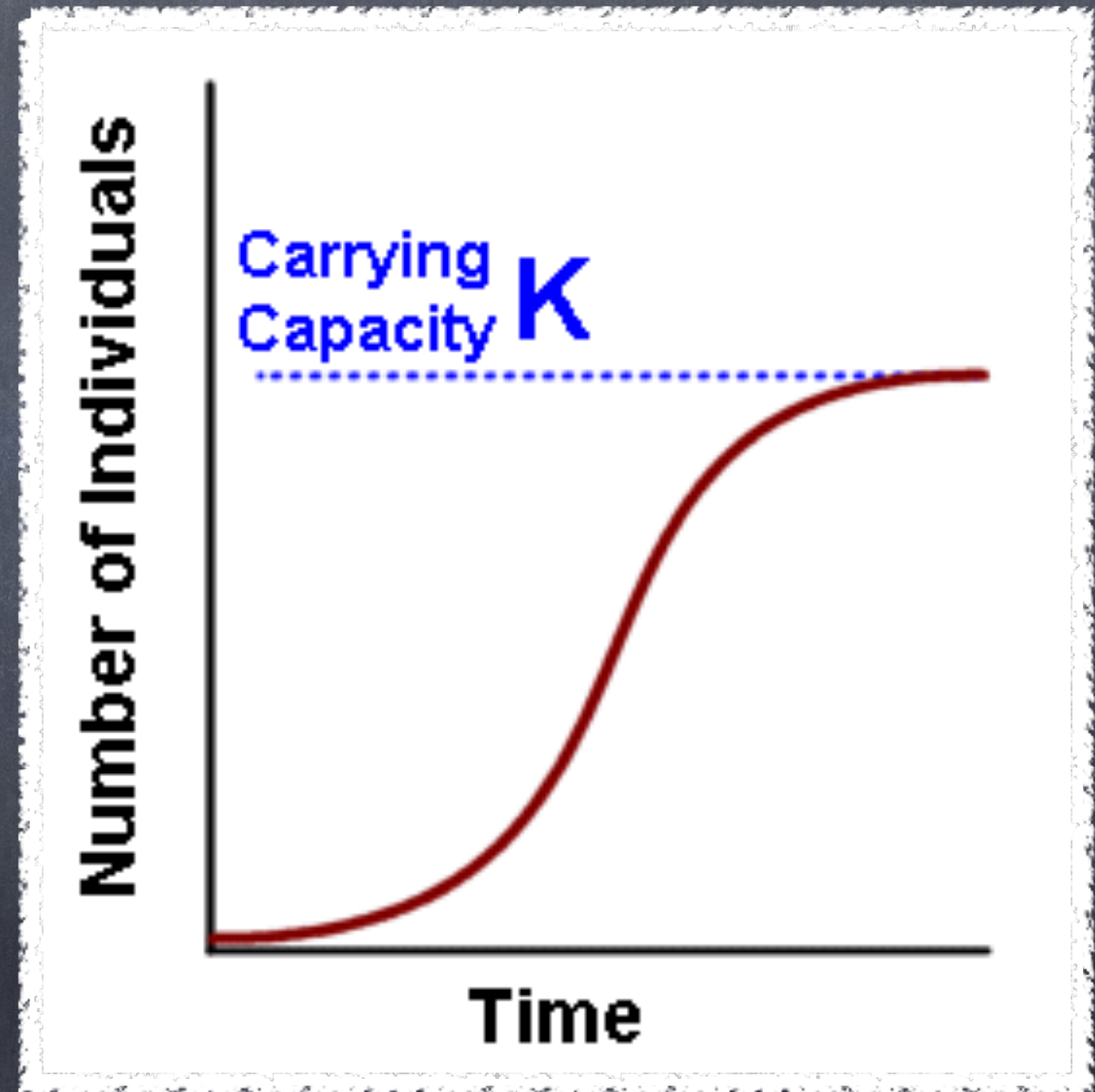
- Carrying Capacity (K)

- The number of individuals the environment can support over a long period of time



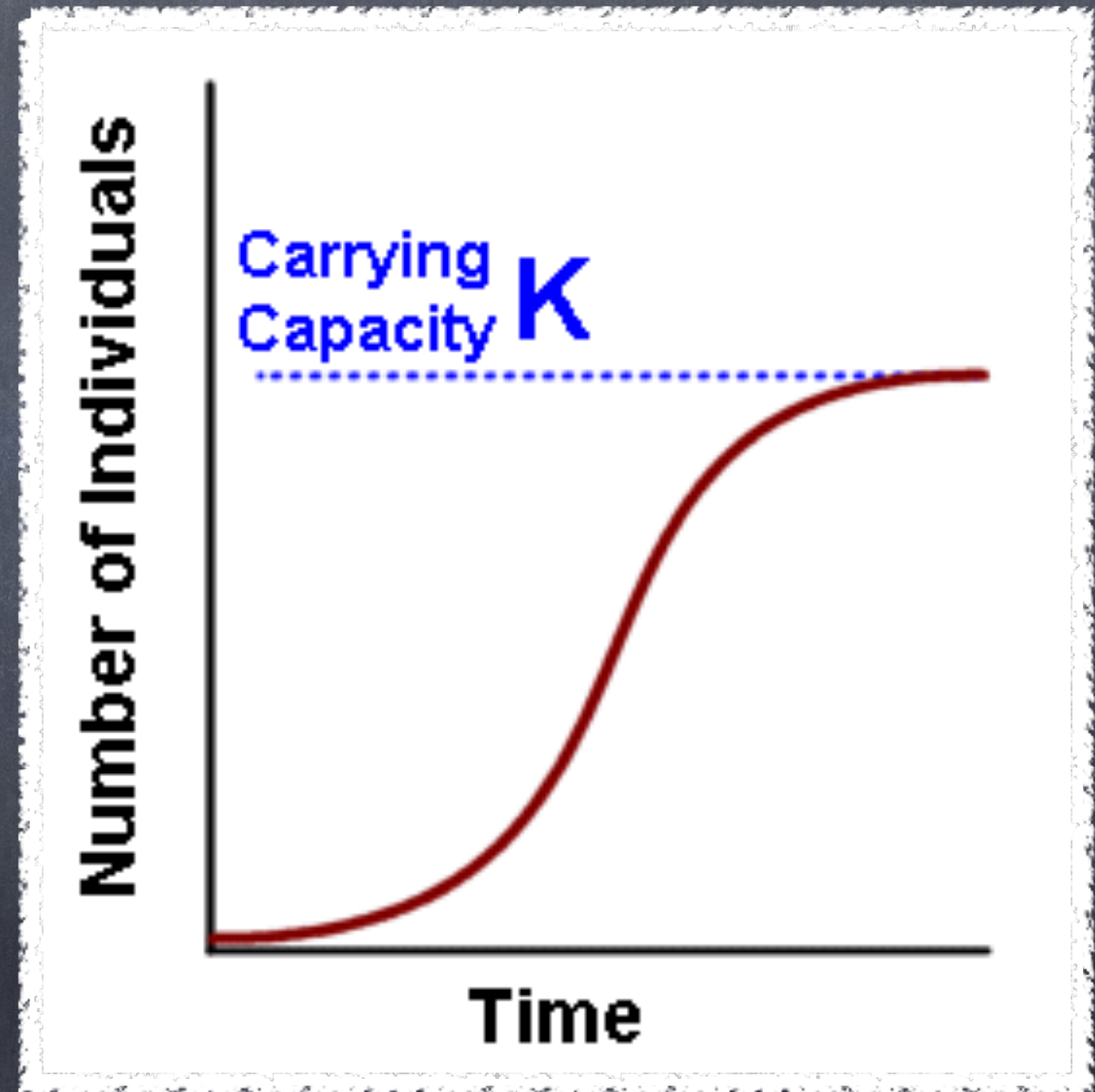
The Logistic Model

- When a population size is at its carrying capacity, the birth rate equals the death rate and growth stops.
- This pattern of growth is known as **logistic growth**.



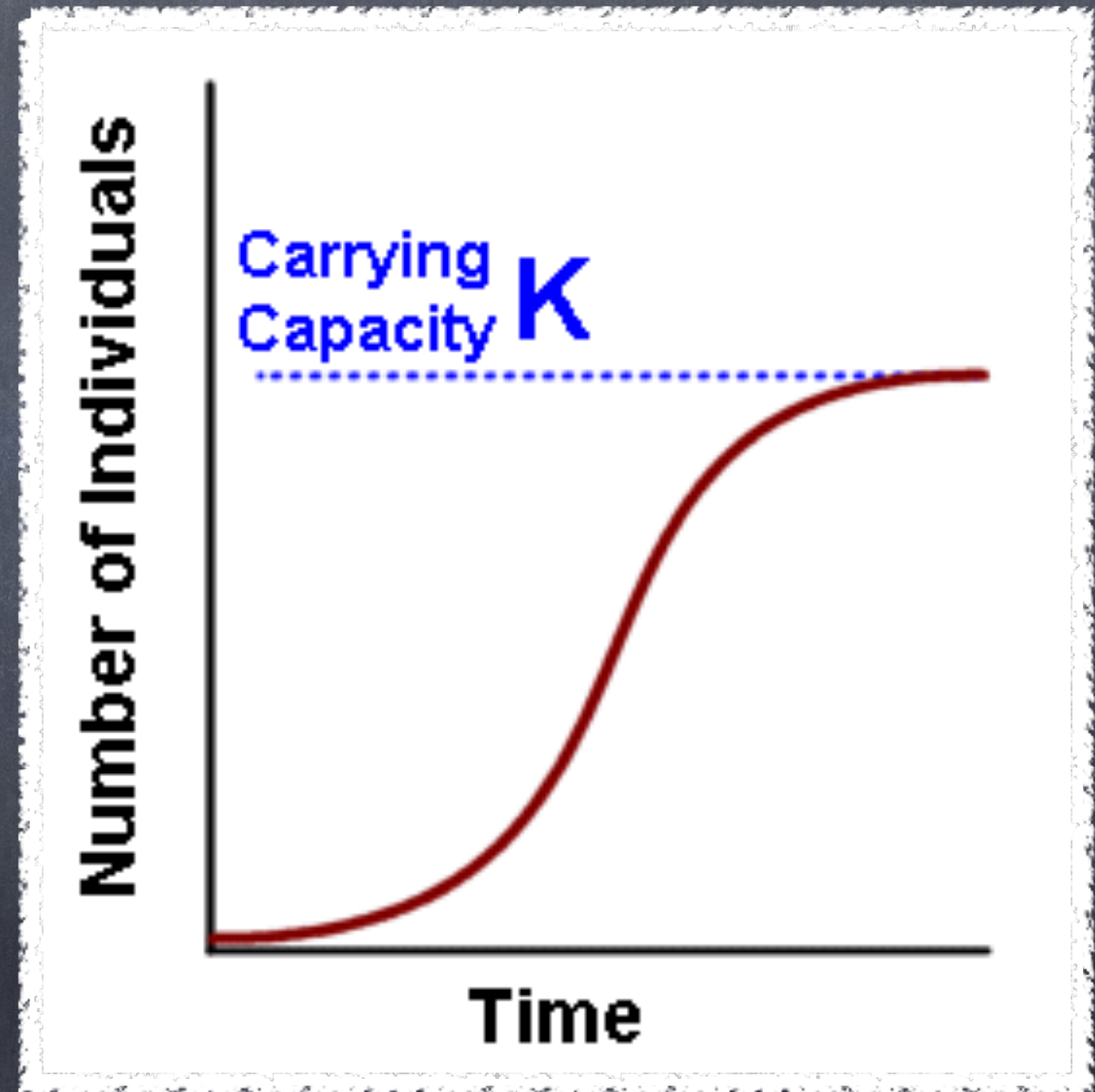
The Logistic Model

- Contains a few assumptions
- One assumption is that the carrying capacity is constant and does not fluctuate with environmental changes



The Logistic Model

- The logistic model is not a universal representation of real populations.
- They are an important tool that scientists use to explain population.



Population Regulation

◉ Density - Independent Factors

- Weather, floods, and fires, reduce the population by the same proportion regardless of the population size

Population Regulation

- ◉ Density - Dependent Factors

- Resource limitations, such as shortage of food or nesting sites, and are triggered by increasing population density

- ◉ With density - dependent factors, an individual's chance of surviving or reproducing depends on the number of individuals in the same area

Symbiosis

- Symbiosis is a close, long-term relationship between two organisms
- Three examples of symbiotic relationship:
 - Parasitism
 - Mutualism
 - Commensalism

Parasitism

- A relationship in which one individual is harmed while the other individual benefits
- Example: tapeworms are endoparasites in humans

Mutualism

- A relationship in which both organisms derive some benefit
- Example: bees pollinating plants

Commensalism

- A relationship in which one organism benefits, but the other organism is neither helped or harmed
- Example: a squirrel living in a tree

Animal
Plant
Microbe
Fungi

A

Animal
Plant
Microbe
Fungi

B

Mutualism



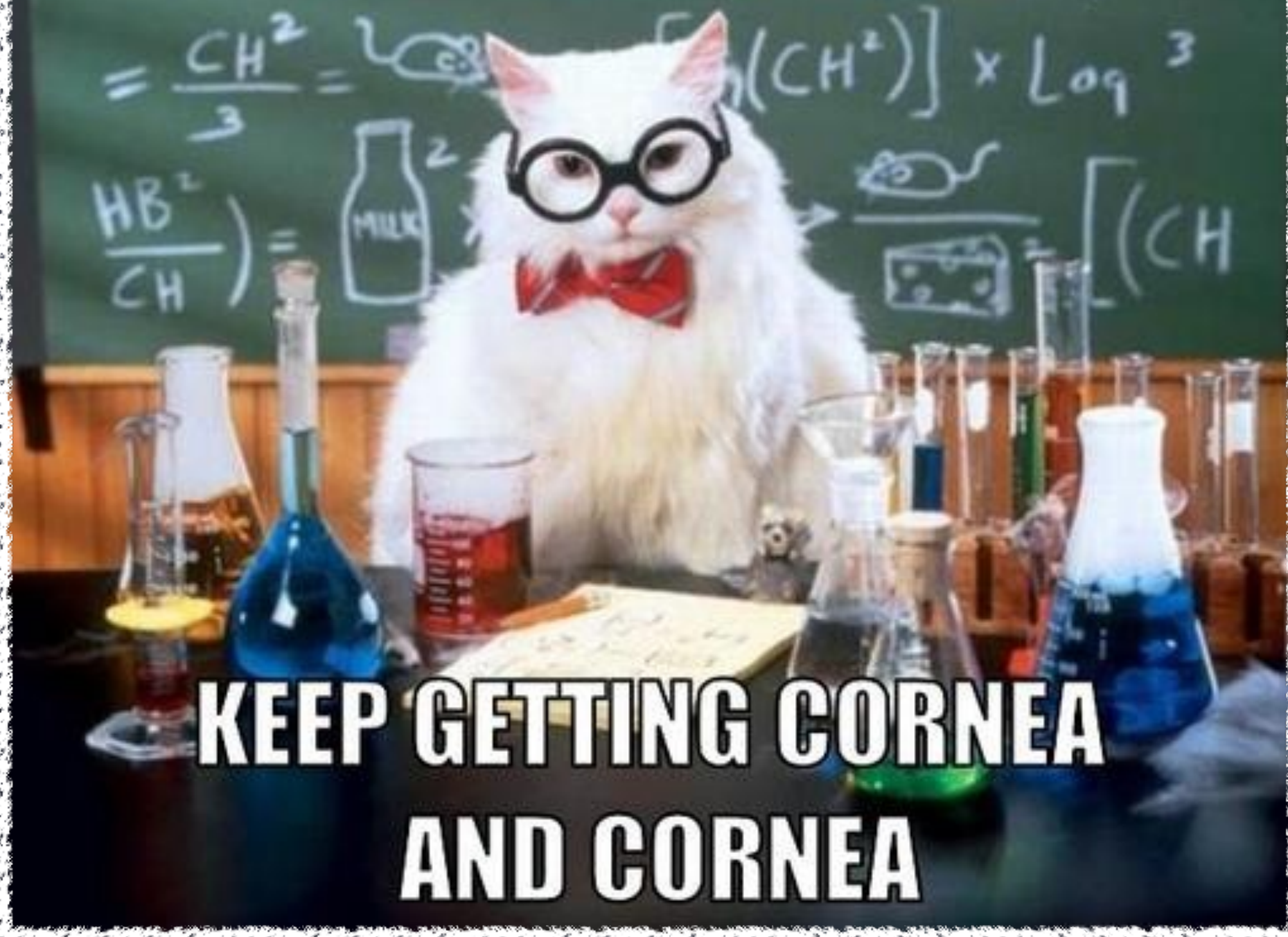
Commensalism



Parasitism



THESE BIOLOGY AND CHEMISTRY JOKES



KEEP GETTING CORNEA
AND CORNEA